ZEFIROV, A.P., prof., doktor tekhn. nauk; NEVSKIY, B.V.; IVANOV,
G.F.; VORONOVA, A.I., red.; MAZEL', Ye.I., tekhn. red.

[Plants for the processing of uranium ores in capitalist
countries] Zavody po pererabotke uranovykh rud v kapitalisti-
cheskikh stranakh. Pod obshchei red. A.P.Zefirova. Moskva,
Gosatomizdat, 1962. 370 p.   (MIRA 15:7)
                 (Uranium industry)

GRIGOR'YEV, B.V.; KIPERMAN, S.Ya.; IVANOV, G.F.

    Anode belt machining. Mashinostroitel' no.3:30-32 Mr '64.

                                   (MIRA 17:4)

ACCESSION NR: AP4022349   S/0117/64/000/003/0030/0032

AUTHORS: Grigor'yev, B. V.; Kiperman, S. Ya.; Ivanov, G. F.

TITLE: Anode grinding with a belt

SOURCE: Mashinostroitel', no. 3, 1964, 30-32

TOPIC TAGS: metal cutting, anode grinding, electromechanical machining, electric arc machining, titanium, stainless steel

ABSTRACT: Belt anode grinding of conductive materials was investigated using the apparatus shown in Fig. 1 on the Enclosure. The part (2) turns between centers and is connected to the positive terminal of a D.C. supply. A continuous steel belt (1) is connected to the negative terminal. An electrolyte consisting of a colloidal solution of liquid glass ($Na_2O \cdot nSiO_2 + mH_2O$) is continuously introduced between the belt and the part, forming a film which is removed by the belt. Arcs formed in this region melt out the material. The test apparatus permitted work on samples 8-50 mm in diameter and 30-400 mm long. The voltage was 24-30 V, and the current ranged between 120 and 180 amps for titanium and was 300 amps for stainless steel. The method was found practical for preliminary machining (7-9 class finish)

Card 1/3

ACCESSION NR: AP4022349

of very hard metals. The possible time saving was demonstrated by turning a 25 x
25 x 60 mm heat-resistant steel sample to a 15-mm diameter cylinder in a lathe.
This process required 15 minutes. The same result was attained by anode grinding
in only 40 seconds. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 00   DATE ACQ: 08Apr64   ENCL: 01

SUB CODE: MM   NO REF SOV: 000   OTHER: 000
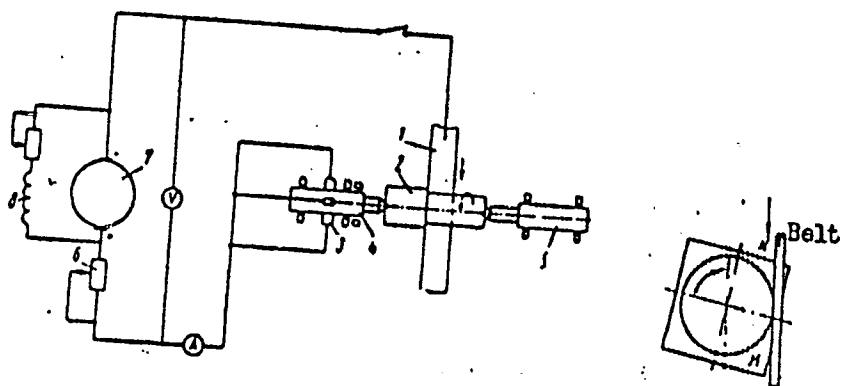
Card 2/3

Fig. 1. Schematic of apparatus

1- belt, 2- part, 3- brushes, 4- head spindle, 5- tail stock,
6- rheostat, 7- generator, 8- winding.

Card 3/3

IVANOV, G.F.; CHEREHURINA, Ye.N.

Testing of a DEShU-M unit. Nov.nauch.-issl.rab.po.metr. VNIIM
no.5:14-17 '64.   (MIRA 18:3)

IVANOV, G.G. [Ivanov, H.H.], kand.ekon.nauk

Economic accountability for collective farms.   Nauka i zhyttia
8 no.8:33-35 Ag '58.   (MIRA 12:1)
                    (Farm management)

MOSTIPAN, L.I.; IVANOV, G.G. [Ivanov, H.H.], kand.ekon.nauk

Interfarm cooperation. Nauka i zhyttia 10 no.2:35-37 F '60.
(MIRA 13:6)

1. Predsedatel' soveta Chernigovskogo "Oblmizhkolgospbudu."
(Collective farms--Interfarm cooperation)

SMIRNOV, I.N.; IVANOV, G.G., redaktor; KOLESNIKOVA, A.P., tekhnicheskiy
    redaktor.

[Work practice on a skidding tractor] Opyt raboty na trelevochnom
traktore. Moskva, Goslesbumizdat, 1953. 16 p.   (MIRA 7:8)
    (Tractors) (Lumbering)

1. IVANOV, G. G., Eng.; ALYAB'YEV, V. I., Eng.

2. USSR (600)

4. Electricity in Lumbering

7. For over-all electrification of lumbering operations. Les. prom. 13, No. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, _____April_____ 1953, Uncl.

Ivanov, G. G.

KARASIK, Leonid Borisovich; IVANOV, G.G., red.; SHAKHOVA, L.I., red.izd-va; KARASIK, N.P., tekhn.red.

[We are introducing new and advanced methods; practices of the Mitin lumber camp] Osvaiavaem novoe, peredovoe; iz opyta raboty Mitinskogo lespromkhoza. Moskva, Goslesbumizdat, 1957. 27 p.
(MIRA 11:1)

(Lumbering)

SOV/3-58-12-11/43

AUTHOR: Ivanov, G.G., Deputy Director of the Publishing Office

TITLE: It is Necessary to Establish a Publishing House "Higher
              School" (Neobkhodimo sozdat' izdatel'stvo "Vysshaya shkola")

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 12, pp 43 - 44   (USSR)

ABSTRACT: The necessity of developing the correspondence system of
              education has raised the problem of providing students with
              good training aids. At present, there are practically no
              training aids for correspondence students. and the methodi-
              cal literature issued by the Publishers "Soviet Science"
              does not suffice. The author lists the number of textbooks
              and some fundamental works on physics and chemistry printed
              in recent years by this publishing house. He considers it
              not practical that 38 publishing offices should print the
              textbooks required by vuzes, and suggests that a new special
              publishing house "Vysshaya shkola" be established. Its task
Card 1/2   should be primarily to write and issue the entire training-

22(1)   SOV/3-59-5-4/34

AUTHOR: Ivanov, G.G., Deputy Director

TITLE: Foremost Attention to be Given to the Publication
              of Textbooks

PERIODICAL: Vestnik vysshey shkoly, 1959, Nr 5, pp 25 - 28
              (USSR)

ABSTRACT: The reorganization of the system of higher edu-
              cation realized at present demands urgently that
              all students, and first the correspondence stu-
              dents, be supplied in good time with training li-
              terature on all subjects, for at present there are
              almost no textbooks especially composed for corres-
              pondence students. In the articles of P.I. Polukhin,
              Member of the Board of the USSR Ministry of Higher
              Education, Professor I.V. Kharizomenov, V.V. Motilov,
              O. Ya. Novikov, etc., published in this periodical,
              Nr 12 of 1958 and Nr 3 and 4 of 1959, several im-
              portant problems have been raised relating to the
              trend of the work. In this article the author deals
Card 1/4   with another aspect of the case - the participation

SOV/3-59-5-4/34

Foremost Attention to be Given to the Publication of Textbooks

of the publishing offices in supplying the vuzes
with training literature. He stresses the necessity
for a strict coordination of the work between all
state publishing enterprises. At present, about
40 publishing offices of various ministries and de-
partments are engaged in printing textbooks. For
the parallelism involved, the author quotes a few
examples mentioning the publishing offices "So-
vetskaya nauka", Stroyizdat, "Rechnoy transport",
Subpromgiz, Uchpedgiz and Medgiz. For these short-
comings arising in the publication of textbooks,
a certain blame is attached to the Ministry of
Higher Education and its Methodological Administrat-
ion. To prove the absence of a proper plan in writ-
ing textbooks for new and rapidly developing fields
of science and engineering, the author cites the
books of O.K.Davtyan "Quantum Chemistry" and of
V.G. Konarёv "Nuclein Acids and the Morphogenesis

Card 2/4

SOV/3-59-5-4/34

Foremost Attention to be Given to the Publication of Textbooks

of Plants", which the Ministry simply re-forwarded to the publishing firm. The author considers that the Methodological Administration of the USSR Ministry of Higher Education should become a center regulating the issue of textbooks by the various publishing offices. The publishing house "Vysshaya shkola" (Higher School), whose establishing is being planned, should have the guiding part in the publication of training literatures for vuzes. The Glavnoye upravleniye universitetov (Main Administration of Universities) is blamed for permitting an excessive extension of the manuscript. Reference is made to A.B. Kogan's book "The Physiology of the Higher Nervous Activity", the size of which was increased by the Glavnoye upravleniye universitetov, ekonomicheskikh i yuridicheskikh vuzov (Main Administration of Universities and Vuzes of Economics and Law) to 10 sheets. The author advises to expand

Card 3/4

ANUCHIN, N.P., prof., otv. red.; BRASLAVSKAYA, M.M., red.;
     DERYABIN, D.I., kand. sel'khoz. nauk, red.; ZHELEZNOV,
     G.F., kand. sel'khoz. nauk, red.; IVANNIKOV, S.P., kand.
     sel'khoz. nauk, red.; IVANOV, G.G., red.; LARYUKHIN, G.A.,
     kand. tekhn. nauk, red.; LOGITSKIY, K.B., doktor sel'khoz.
     nau zam. otv. red.; MIRONOV, V.V., kand. sel'khoz. nauk,
     red.; RODIONOV, A.Ya., kand. sel'khoz. nauk, red.;
     TRUBNIKOV, M.M., kand. ekon. nauk, red.; CHEVEDAYEV, A.A.,
     kand. sel'khoz. nauk, red.; SHUMAKOV, V.S., kand. sel'khoz.
     nauk, red.; YURGENSON, P.B., doktor biol. nauk, red.; TROPIN,
     I.V., kand. sel'khoz. nauk, red.

[Studying the performance of new machinery in silvicultural
work; scientific papers] Issledovanie rabochikh protsessov
novykh mashin na lesokul'turnykh rabotakh; nauchnye trudy.
Moskva, Izd-vo "Lesnaia promyshlennost'," 1964. 111 p.
                                               (MIRA 17:7)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut
lesovodstva i mekhanizatsii lesnogo khozyaystva.

IVANOV, G.G. (Moskva)

Imaginary and true progress of science; "Science and militarism in
the United States" by Iu. M. Sheinin. Reviewed by G.G.Ivanov.
Priroda 53 no. 12:106-107 '64.   (MIRA 18:1)

IVANOV, G.G.

Age variations in the reduction capacity of the brain and other animal tissues. G. G. Ivanov. *Bull. biol. méd. expd. U. S. S. R.* 7, 216-18(1939)(in English). —The brain tissue, cardiac and striated muscle, spleen and testicles of white rats show 3 stages in the reduction of methylene blue (I) during the course of animal life. In the 1st stage, at ages from 2 weeks to sexual maturity (3 mos.) a high reducing capacity is shown by rapid decolorization of I. The 2nd stage (3 mo. to 2 yrs.) is characterized by a slow reduction of I, while in the 3rd stage a comparatively rapid decolorization of I again occurs. The liver and kidneys, however, in the 1st stage show a min. with extremely slow decolorization of I. During the 2nd stage the reduction capacity increases markedly, followed by a new decrease in the 3rd stage. An electrometric study showed the brain tissues of young and old animals to have similar E_h values, while that of adult animals was considerably lower.

S. A. Karjala

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SHANIN, A.P., professor; IVANOV, G.G.

Characteristics of gastric secretory-motor functions in pre-
cancer and cancer of the stomach. Vop.onk.1 no.1:86-90 '55.

1. Iz Instituta onkologii AMN SSSR (direktor--chl.korr. AMN
SSSR prof.A.I.Serebrov, nauchnyy konsul'tant- chl-korr. AN
SSSR, deystv.,chl. AMN SSSR, z.d.n., prof. N.N.Petrov)
A.P.Shanina--g. Leningrad, ul. Rubinshteyna, 6, kv.25; G.G.
Ivanova--g.Leningrad, Aptekarskiy per.,4, kv.7.
              (STOMACH, neoplasms,
                  gastric secretion & motor funct. in prepancer & cancer)
              (GASTRIC JUICE,
                  secretion in precancer & cancer of stomach)

LATMANIZOVA, L.V.; RAKOV, A.I.; IVANOV, G.G.; MEL'NIKOV, R.A.; MONOSOVA,F.Ye.

Physiological study of functional peculiarities of the human nervous
system in cancer of the stomach. Biul.eksp.biol. i med. 41 no.3:
18-22 Mr '56.

(MLRA 9:7)

1. Iz kafedry fiziologii i anatomii (zav.-prof. L.V.Latmanizova)
Pedagogicheskogo instituta, 2-go khirurgicheskogo otdeleniya
(zav.-prof. A.I.Rakov) i klinicheskoy laboratorii (zav. G.G.Ivanov)
Instituta onkologii AMN SSSR, Leningrad. Predstavlena deystvitel'nym
chlenom AMN SSSR N.N.Petrovym.

    (STOMACH, neoplasms
      electrocorticography in)
    (ELECTROENCEPHALOGRAPHY, in various dis.
      electrocorticography in cancer of stomach)

USSR/General Problems of Pathology - Tumors   U-4

Abs Jour : Ref Zhur - Biol., No 7, 1958, No 32656

Author   : Rakov A.I., Shemyakina T.V., Shchukareva N.K., Ivanov G.G.
Inst   : Not Given
Title   : Functional Characteristics of the Stomach During Tumorous
           and Pretumorous Illnesses.

Orig Pub : Vopr. onkologii, 1957, 3, No 1, 42-49

Abstract : The secretory function of the stomach (SFS) was studied in
           128 patients with cancer of the stomach (CS), in 28 patients
           with polyposis of the stomach (PS), in 28 with stomach ulcers
           and in 37 with gastritis. The determination of the digesting
           strength of the stomach juice, and of the content in it of
           chlorides permitted the judgement of the depth of the
           organic changes. During CS and PS, there were secondary and
           tertiary degrees of insufficiency of SFS, which contributed
           to atrophic changes of mucous membrane of the stomach. During
           ulcerous illness, there was observed no suppression of the

Card   : 1/2

26

Card   : 2/2

POTAMOSHNEV, S.P.;   IVANOV, G.G.

Calculation of labor productivity in the tire industry. Kauch.
i rez. 20 no. 4:49-53 Ap '61.   (MIRA 14:5)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
        (Rubber industry—Labor productivity)
                (Tires, Rubber)

POTAMOSHNEV, S.P.; IVANOV, G.G.; ZHELEZOV, V.A.

Experiment in the use of labor consumption data as an
analytical index of labor productivity in rubber tire plants.
Kauch.i rez. 21 no.5:42-47 My '62.   (MIRA 15:5)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
         (Rubber industry—Labor productivity)

POTAMOSHNEV, S.P.; IVANOV, G.G.

Organization and methods of accounting for the results of the
contests for the title of collectives of communist labor in
the factories of the tire industry. Kauch. i rez. 22 no.6:
40-43 Je '63.   (MIRA 16:7)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
            (Rubber industry workers)
            (Socialist competition)

BELEVICH, V.V.; SHVETSOVA, V.F.; ZHITYAYKINA, N.F.; BYKADOROV, I.S.;
    IVANOV, G.I., kand.sel'skokhoz.nauk; GERMANISHVILI, V.Sh.,
    kand.geogr.nauk, retsenzent; SOKOLOV, I.F., retsenzent;
    KALMYKOVA, V.V., retsenzent; LYUBOMUDROVA, S.V., retsenzent;
    KRUZHKOVA, T.S., retsenzent; BOYKOVA, K.G., retsenzent;
    NOVSKIY, V.A., otv.red.; VLASOVA, Yu.V., red.; SERGEYEV, A.N.,
    tekhn.red.

[Agroclimatic manual for the Maritime Territory] Agroklimaticheskii
spravochnik po Primorskomu kraiu. Leningrad, Gidrometeor.izd-vo,
1960. 129 p.   (MIRA 14:4)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye gidrometeoro-
logicheskoy sluzhby. Primorskoye upravleniye. 2. Vladi-
vostokskaya gidrometeorologicheskaya observatoriya (for Belevich,
Shvetsova, Zhityaykina, Bykadorov). 3. Dal'nevostochnyy nauchno-
issledovatel'skiy gidrometeorologicheskiy institut (for Germanishvili,
Sokolov, Kalmykova, Lyubomudrova, Kruzhkova, Boykova).
    (Maritime Territory--Crops and climate)

AUTHORS: Ivanov, G. I., Morgulis, P. S. and Romanenko, N. T.

TITLE: Computation charts for diesel-engine turbocharging units

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye ustanovki, no. 9, 1962, 54, abstract 42.9.299. In collection "Gazoturbin nadduv dvigateley vnutr. sgoraniya", M., Mashgiz, 1961, 149–160

TEXT: A set of charts is presented for calculating the following parameters: sizes and rotational speed of the impeller of radial-flow superchargers; mean diameter and length of blades of the central turbinestage; and conditions for joint operation of engine and turbine. The method may be applied both to a selfcontained unit and to a diesel-powered set. The various stages in the use of the computation method are dealt with and methods of plotting and practical application of the charts are described. There are 4 references.

[Abstracter's note: Complete translation.]

Card 1/1

IVANOV, G.I.; LISHIN, L.G.

Automatic low-frequency gain control circuit using a transistor
diode. Trudy VNAIZ no.10:58-64 '62.   (MIRA 16:11)

IVANOV, G.I.; MUSIN, N.Kh.; BATYROV, Kh.M.

 Hydraulic sand-jet perforation in fields of the Oil Field Administration
 of the Aksakovo Petroleum Trust. Nefeprom.delo no.5:30-34 '64.
               (MIRA 17:9)

 1. Neftepromyslovoye upravleniye "Aksakovneft'".

IVANOV, G. I.

"Soil Conditions of the Southern Primor'ye in Relation to the Cultivation of Ginseng." Cand Agr Sci, Soil Inst imeni V. V. Dokuchayev, Acad Sci USSR, Moscow, 1955. (KL, No 8, Feb 55)

SO: Sum. No. 631, 26 Aug 55- Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions. (14)

IVANOV, G.I.

Vladivostok Branch of the All-Union Society of Soil Scientists.
Pochvovedenie no.4:119 Ap '58.   (MIRA 11:5)
                        (Soviet Far East--Soil research)

IVANOV, G.I.

Principal features of the distribution of soils on the right
bank of the Ussuri River. Soob.DVFAN SSSR no.11:3-8 '59.
(MIRA 13:11)

1. Dal'nevostochnyy filial imeni V.L.Komarova Sibirskogo
otdeleniya AN SSSR.
            (Ussuri Valley--Soils)

IVANOV, G.I.

Soil conditions associated with wild and cultivated ginseng in the
Suputinka Preserve. Mat. k izuch. zhen'shenia i lim. no.4:7-15 '60.
(MIRA 13:9)

1. Dal'nevostochnyy filial Sibirskogo otdelaniya AN SSSR.
   (SUPUTINKA PRESERVE—FOREST SOILS)   (GINSENG)

IVANOV, G.I.;   TSISKIS, L.S.

Designing combined biofiltration for enterprises having an uneven
flow of waste water.   Vod.i san.tekh. no.1:24-25 Ja '56.

(MLRA 9:5)

(Filters and filtration) (Sewage--Purification)

IVANOV, G.I.

Experience in the anaerobic purification of the waste
waters of leather factories. Kozh.-obuv. prom. 4 no.7:30-
33 Jl '62.
(MIRA 17:1)

ABRAMOVICH, Il'ya Aleksandrovich. Prinimal uchastiye IVANOV, G.I.,
inzh.; KUCHER, P.Ye., inzh., retsenzent; PLEMYANNIKOV, M.N.,
red.; VINOGRADOVA, G.A., tekhn. red.

[Purification of sewage waters of leather factories] Ochi-
stka stochnykh vod kozhevennykh zavodov. Moskva, Gizlegprom,
1963. 236 p. (MIRA 16:9)
(Leather industry) (Industrial wastes—Purification)

IVANOV, G.I. [Ivanov, H.I.]

Pollution of the sewage waters of leather factories. Izh.prom.
no.3:49-51 Jl-S '63.   (MIRA 16:11)

ROZENBERG, V.A.; IVANOV, G.I.; PROZOROV, Yu.S.

Amur Forestry Expedition of the Far Eastern Branch of the
Academy of Sciences of the U.S.S.R. in 1955. Soob.DVFAN
SSSR no.9:155-156 '58.   (MIRA 12:4)
                    (Sikhote-Alin Range—Coniferae)

IVANOV, G.I.

Tekhnika bezopasnosti na stroitel'nykh i remontnykh rabotakh (Safety engineering in construction and repair work). Moskva, Profizdat, 1953. 86 p. (V pomoshch' profaktivu po okhrane truda)

SO: Monthly List of Russian Accessions, Vol 7, No 9, Dec 1954

IVANOV, Georgiy Ivanovich; NOVOSPASSKIY, V.V.,redaktor; KIRSANOVA,
N.A.,tekhnicheskiy redaktor

[Work safety in large panel and block construction] Bezopasnost'
truda pri krupnopanel'nom i krupnoblochnom stroitel'stve.
Moskva, Izd-vo VTsSPS Profizdat, 1956. 91 p.   (MIRA 10:4)
        (Building--Safety measures)

IVANOV, Georgiy Ivanovich; NOVOSPASSKIY, V.V., red.; RAKOV, S.I.,
        tekhn.red.

    [Safety engineering in conducting building and repair operations]
    Tekhnika bezopasnosti na stroitel'nykh i remontnykh rabotakh.
    Moskva, Izd-vo VTsSPS Profizdat, 1959. 154 p.   (MIRA 13:3)
                    (Building—Safety measures)

20515
S/114/61/000/005/003/003
E194/E435

26.2120

AUTHORS: Ivanov, G.I., Engineer and Perfilov, V.G., Engineer

TITLE: Extending the Working Range of a Centrifugal Compressor

PERIODICAL: Energomashinostroyeniye, 1961, No.5, pp.36-38

TEXT: This article describes results obtained at the Kolomenskiy
zavod im. V.V.Kuybysheva (Kolomna Works imeni V.V.Kuybyshev) in
studying the possibility of extending the working range of a
centrifugal compressor by a method which combines adjusting the
angle of the blades of the stationary guide vanes and adjusting the
angle of the inlet section of the diffuser blades.   In this way
the compressor range could be increased by a factor of more than 3
without appreciable loss of head or efficiency.   The working
range of a centrifugal compressor is limited in the low flow region
by intensive breakaway of the air flow in the diffusers.   At high
throughputs the compressor output is limited by the flow capacity
of the guide vanes and diffusers.   The working range of the
compressor δ is defined as the difference between the maximum
and minimum referred air flows divided by the minimum flow.   The
works has designed and manufactured a compressor intended for use

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Extending the Working Range ...   E194/E435

in the gas turbine supercharger of a diesel engine.   The
compressor has two control mechanisms, one being alteration of the
angle of the stationary guide vanes and the other being rotating
inlet sections of the diffuser blades.   Constructional features
of the experimental compressor are shown in Fig.1. The stationary
guide vanes with rotating blades are indicated in the figure by
the number (10).   The blades are made of aluminium alloy and
rotate in bronze guides (16) in the inlet duct.   Each diffuser
blade is made in two parts, a rotating tip (26) and a stationary
part (25).   The stationary part of the blade is made as a unit
with the diffuser disc (24). The blade tips can rotate about their
axes, to each axis (22) a tooth wheel (21) is attached which is
driven from a toothed ring (19).   By altering the position of this
ring, the angle of the blade tips can be adjusted.   Tests were run
on the compressor and the results are plotted in the graphs of
Fig.2, 3 and 4.   The notation used is: π_k and η_{ad} –   the
compression ratio and adiabatic efficiency; H_{ad} – the head.
Fig.2 gives the compressor characteristics when controlled only by
the diffuser blades ($\alpha_1 = 0$; $\Delta\alpha_3 = -5°30'$, $-4°00'$,   0, $+4°00'$,
$+5°30'$).   It will be seen that turning the tips through an angle
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S/114/61/000/005/003/003
Extending the Working Range ...   E194/E435

of $\pm$ 5°30' has little influence on the efficiency or head, and with the tips in the neutral position the range δ = 35.8%. When the tips are rotated the range δ = 93.6%, thus it has been increased almost threefold. Fig.3 gives compressor characteristics when controlled only by the stationary guide vanes at the compressor intake ($\Delta\alpha_3$ = 0; α_1 = -32°, -24°, -13°, 0, +13°, +24°). In this case extension of the working range of the compressor to 90.2% by setting up a positive swirl in the air flow is accompanied by an appreciable drop (7 to 8%) in the compression ratio because the amount of work delivered to the air by the runner is reduced. The development of negative swirl reduces the adiabatic efficiency (by 7 to 9%) because of increased losses in the runner. Fig.4 shows compressor characteristics with simultaneous control by both methods and shows that in this way the working range can be increased up to 110%, the drop in adiabatic efficiency and head is 6 to 7% (α_1 and $\Delta\alpha_3$ are respectively: -24° and -5°30'; -24° and -3°30'; 0 and 0; +24° and +3°30'; +24° and +5°30'. From the standpoint of achieving a wide working range, the combined method of control is effective. However, the construction of the control mechanisms is complicated and for most practical purposes the Card 3/8

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Extending the Working Range ...   S/114/61/000/005/003/003
E194/E435

necessary range can be achieved by use of diffuser control alone.
There are 4 figures and 1 Soviet reference.

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IVANOV, G. I., ...

Approximation method for calculating the ... range
of a centrifugal compressor with regulated blade diffusers.
Energomashinostroenie 10 no.5:10-13 My '64.   (MIRA 17:8)

ACCESSION NR: AP4038901   S/0114/64/000/005/0040/0043

AUTHOR: Ivanov, G. I. (Engineer)

TITLE: Approximate method of calculating the range of operation of a centrifugal compressor with an adjustable blade diffuser

SOURCE: Energomashinostroyeniye, no. 5, 1964, 40-43

TOPIC TAGS: compressor, centrifugal compressor, compressor operation, adjustable blade compressor, high pressure compressor

ABSTRACT: A new compressor was built and tested in which the inlet parts of the blades are made adjustable within $\pm 5°33'$. Its characteristic is shifted, by the blade adjustment, into the small or large air-flow region almost without changing its shape. The article gives a method for calculating the shift of the characteristic of a centrifugal-compressor high-pressure stage. The use of adjustable diffuser blades makes possible not only reducing impact losses during off-

Card 1/2

ACCESSION NR: AP4038901

design conditions, but also varying the compressor capacity as well. Having calculated the maximum air flow through the diffuser, i.e., its capacity at the extreme positions of the diffuser blades, the shift of the compressor characteristic can be determined. The stage characteristics should lie within the air flow range ensured by the impeller. Inlet cross-sections of the rotating guide blade assembly and of the blade diffuser determine the critical speeds in the compressor. Formulas and curves for computing the maximum air flow and the inlet cross-sections are given. Orig. art. has: 6 figures and 6 formulas.

ASSOCIATION: Kolomenskiy teplovozostroitel'ny*y zavod (Kolomna Diesel-Locomotive Plant)

SUBMITTED: 00   DATE ACQ: 05Jun64   ENCL: 00

SUB CODE: PR   NO REF SOV: 004   OTHER: 000

Card 2/2

IVANOV, G. I.:

IVANOV, G. I.: "On the problem of dynamic changes in the amounts of calcium, potassium, and magnesium in the blood plasma of patients before, during, and after operations". Simferopol', 1955. Crimean State Medical Inst imeni I. V. Stalin. (Dissertations for the Degree of Candidate of Medical Sciences.)

So. Knizhnaya letopis'. No. 49, 3 December 1955. Moscow.

T

USSR / Human and Animal Physiology. Respiration.

Abs Jour   : Rof Zhur - Biol., No 15, 1958, No. 70235

Author   : Botvinnikov, B. A.; Ginzburg, I. Sh.; Gramenitskiy, P. M.;
             Ivanov, G. I.; Ivchenko, O. I.; Libin, Yu. M.; Rudnyy, N. M.;
             Salmanov, L. P.; Fol'dman, L. A.; Froyman, G. N.

Inst   : Academy of Sciences USSR

Titlo   : The Influence of Elevated Intrapulmonary Prossure on
             Rospiration and Circulation

Orig Pub   : In the collection, Funktsii organizma v usloviyakh izmen-
             onnoy gazovoy srody, Moscow-Leningrad, AN SSSR, 1955, No 1,
             118-160

Abstract   : The experimental arrangement permitted elevating the
             pressure on inspiration and expiration either separatoly
             or conjointly. In acute and chronic experiments on dogs,
             recordings were made of the thoracic and abdominal
             breathing, of the pressures in the intervalvular space

Card 1/3   73

USSR / Human and Animal Physiology. Respiration.

Abs Jour   : Rof Zhur - Biol., No 15, 1958, No. 70235   T

(in the respiratory tract) and in the abdominal cavity,
and also of ventilation and of arterial and venous blood
pressures. Upon elevation of the pressure during expira-
tion, there was a considerable distention of the thoracic
cage and abdomen and a diminution in pulmonary ventilation
due to sharp reduction in respiratory rate; there was an
acceleration in the onset of, and a diminution in the depth
of, inspiration, with prolongation of the expiratory phase;
there was also a reduction in the average level of arterial
pressure, an increase in its respiratory fluctuations, a
slowing of the heart rate, and the appearance of
arrhythmias. With elevated pressure in both expiration
and inspiration, phenomena similar to those described
above progressed to the point of apnea. The degree and
character of the changes of respiration depend on the ratio
of the increased pressures in expiration and inspiration.

Card 2/3

IVANO?, G.I., kand. med. nauk. (Simferopol', ul. Pushkinskaya, d.26, kv. 3)

Invagination of the small intestine caused by fibroma of the wall. Nov.
khir. arkh. 5:131-132 S-O '58.

(MIRA 12:1)

1. Kafedra gospital'noy khirurgii (zav. - prof. K.S. Keropian) ped-
iatricheskogo fakul'teta Krymskogo meditsinskogo instituta.
(INTESTINES--INTUSSUSCEPTION)

IVANOV, G.I.

Kirill Stepanovich Keropian. Ortop.,travm. i protez. 20
no.5:72 My '59.   (MIRA 12:9)
          (BIOGRAPHIES
                Keropian, Kirill S. (Rus))

IVANOV, G.I., kand.med.nauk

Case of extensive electrical injury of the skull. Ortop.,travm.
i protez. 20 no.12:50-52 D '59.   (MIRA 13:5)

1. Iz gospital'noy khirurgicheskoy kliniki (zav. kafedroy - prof.
K.S. Keropian) pediatricheskogo fakul'teta Krymskogo meditsinskogo
instituta (dir. - dotsent S.I. Georgiyevskiy).
          (ELECTRICITY, injurious effects)
          (SKULL wounds & injuries)

IVANOV, G.I., vrach

       Breathing under water. Zdorov'e 6 no.8:13 Ag '60.   (MIRA 13:8)
           (RESPIRATION)   (UNDERWATER PHYSIOLOGY)

KEROPIAN, K.S., prof. (Simferopol', Krymskoy obl., ul. Gor'kogo, d.31, kv.7); IVANOV, G.I., kand.med.nauk

Echinococcosis of the spine. Ortop.,travm.i protez. no.9:25-30 '61.
(MIRA 14:10)

1. Iz kliniki gospital'noy khirurgii (zav. - prof. K.S. Keropian) pediatricheskogo fakul'teta Krymskogo meditsinskogo instituta (dir. - dots. S.I. Georgiyevskiy).
(SPINE—HYDATIS)

IVANOV, Georgiy Ivanovich; TIRSKIY, I.T., red.

[People of the virgin snow]Liudi snezhnoi tseliny.
IAkutsk, IAkutskoe knizhnoe izd-vo, 1963. 40 p.
(MIRA 17:5)

Ivanov, Germogen Ivanovich. Geografiia chastei i vazhneishikh stran, izd. 5den;
uchebnik dlia 6-go klassa nepolnoi srednei i srednei shkoly. Izd. 5., znach.
ispr. i dop. Leningrad, Uchpedgiz, 1940. 219 p.   DLC: G126.19 1940

SO: LC, Soviet Geography, Part I, 1951, uncl.

Ivanov, Germogen Ivanovich. Geografiia chastei sveta i vazhneishikh stran bez SSSR; uchebnik dlia 6-go klassa semiletnei i srednei shkoly. Izd. 8. Moskva, Uchpedgiz, 1946. 200 p.

LC: G126.19 1946

SO: LC, Soviet Geography, Part I, 1951, uncl.

Dobrov, Aleksandr Seienovich, 1902-

Standard textbook on geography for the 6th grade ("Geography of the World's Parts." G. I. Ivanov, A. S. Dobrov. Reviewed by Yu. D. Dmitrevskiy). Izv. Vses. geog. obshch., 84, No. 3, 1952.

9. **Monthly List of Russian Accessions**, Library of Congress, ____October____ 1953. Unclassified.

2

IVANOV, G.I.; DOBROV, A.S.;

[Geography of parts of the world; textbook for class 6 of seven-
year and secondary schools] Geografiia chastei sveta; uchebnik dlia
6 klassa semiletnei i srednei shkoly. Erevan, Aipetrat. 1953. 277 p.
[In Armenian]   (MLRA 8:9)
           (Geography)

IVANOV, G. I.

6739. Ivanov, G. I. Kolkhoz imeni shvernika, verkhne-Mullinskogo
Rayona Molotovskoy Oblasti. (Lit. zapis' Z. P. Polovnikovoy i ye.
S. Mamushinoy). Molotov, Kn. izd., 1954. 36 s. 20 sm. (Uchastnik
Vsesoyuz. S.-KH. Bystavki). 5.000 Ekz. 45k.--(55-2953) P
33E. Ik (47.813)

SO: Knizhnaya Letopis' No. 6, 1955

VANOV, G.I.

IVANOV, G.I.; DOBROV, A.S.

[Maps to C.I.Ivanov's and A.S.Dobrov's textbook "Geography of
regions of the world continents," for class 6] Karty k uchebniku
G.I.Ivanova i A.S.Dobrova "Geografiia chastei sveta" VI klass.
[Moskva] Uchpedgiz, 1954.   (MLRA 8:4)
     (Physical geography--Study and teaching)   (Maps)

IVANOV, G.I.; DOBROV, A.S.; SMIRNOVA, N.P., redaktor; CHUVALDIN, A.M., redaktor kart; MAKHOVA, N.N., tekhnicheskiy redaktor

[Geography of parts of the world and of the most important foreign countries. Textbook for class 6 of the seven-year and secondary schools] Geografiia chastei sveta i vazhneishikh zarubeshnykh stran. Uchebnik dlia 6 klassa demiletnei i srecnei shkoly. Izd. 16-e. Moskva, Gos. uchebno-pedagog. izd-vo Ministerstva prosveshcheniia RSFSR, 1954. 190 p.   (MLRA 7:8)
        (Geography)

IVANOV, Grigoriy Ivanovich; NEUNYLOV, B.A., doktor sel'khoz.nauk,
     otv.red.; KOKHANOVA, E.I., red.

     [Soils of the Maritime Territory] Pochvy Primorskogo kraia.
     Vladivostok, Dal'nevostochnoe knizhnoe izd-vo, 1964. 105 p.
                                        (MIRA 17:6)

IVANOV, G.I.

Ancient weathering surface on crystalline rocks in the Kotuykan
Basin. Geol. i geofiz. no.2:140-144 '64.

(MIRA 18:4)

1. Sibirskiy nauchno-issledovatel'skiy institut geologii,
geofiziki i mineral'nogo syr'ya, Novosibirsk.

IVANCV, G. K., comp.

Katalog bytovykh elektroizdelii.   A catalog of household electrical appliances.
Moskva, 1947. 155 p. (49-18351)

TK455.R8 1947

1. Electric apparatus and appliances - Catalogs. I. Ivanov, G.K. comp. II. Kholodenko,
L.E., comp.

IVANOV, G., inzhener.

Electric shaver. Tekh.mol. 23 no.1:38 Ja'55. (MLRA 8:3)
(Electric apparatus and appliances)

IVANOV, G., inzhener.

Electric fret-saw. Tekh.mol.24 no.8:39 Ag '56. (MLRA 9:9)
(Saws)

IVANOV, G.K., inzhener.

For the fulfillment of production of domestic electric
appliances. Vest.elektroprom. 27 no.3:3-10 Mr '56.   (MLRA 9:12)

1. Ministerstvo elektropromyshlennosti.
        (Electric apparatus and appliances, Domestic)

IVANOV, G.K., inzh.

New domestic electrical appliances. Vest. elektroprom. 27 no.8:
76-78 Ag '56.   (MLRA 10:9)

1. Ministerstvo elektrotekhnicheskoy promyshlennosti.
        (Electric apparatus and appliances, Domestic)

IVANOV, Georgiy Konstantinovich; DOBRYNIN, Ivan Filimonovich; CHUKAYEV,
D.S., nauchnyy red.; KVELCH, N.Ye., red.; TSIRUL'NITSKIY, N.P.,
tekhn.red.

[Electric appliances for household use] Elektroizdeliia v
domashnem bytu. Moskva, Vses.koop.izd-vo, 1957. 107 p.
                                            (MIRA 11:1)
          (Electric apparatus and appliances)

AUTHOR: Ivanov, G.K., Engineer (Ministry of the Electro-technical 419
            Industry.)

TITLE: New domestic electrotechnical products. (Novye bytovye
            elektrotekhnicheskiye izdeliya.)

PERIODICAL: "Vestnik Elektropromyshlennosti"(Journal of the Electrical
            Industry), 1957, Vol. 28, No. 5, pp. 29 - 31, (U.S.S.R.)

ABSTRACT: The article describes briefly new types of domestic electric
            equipment that have recently been produced. They are a tape-
            recorder, a piezo-electric gramophone pick-up, a portable waffle-
            iron and a drive for sewing machines consisting of a motor
            and foot switch. Brief technical data are given about the tape-
            recorder, the pick-up and the sewing machine drive.

            3 figures, no literature references.

1. Ministerstva elektrotekhnicheskuy promyshlennosti

AUTHOR: Ivanov, G., Engineer   SOV/29-58-8-14/23

TITLE: Electric Helpers at Home (Elektricheskiye pomoshchniki v dome)

PERIODICAL: Tekhnika molodezhi, 1958, Nr 8, pp. 22-23 (USSR)

ABSTRACT: In this article the author describes several new improved machines
and devices which make work at home easier. 1.) The kitchen range
without soot: An electric range is not only more hygienic than a
gas range but with it meals can be prepared more quickly. It is of
better advantage to use gas as fuel for electric plants and to make
it possible for the consumer to use the electric current produced.
This also does away with the necessity of laying gas pipes in
houses and streets, which involves a considerable amount of ex-
pense. Also the danger of being poisoned by escaping unburned gas
is banned by using electricity. At Moscow dwelling houses are at
present being planned in the kitchens and bathrooms of which only
electrical equipments will be used. 2.) Laundry is dried by a
machine. Some of the washing machines are provided with devices
for the wringing out and drying of the laundry. Besides, centrif-
ugal drying machines are being manufactured. 3.) Electric razors:

Card 1/3   Soviet constructors are about to develop a new type of electric

Electric Helpers at Home   SOV/29-58-8-14/23

razor with an alkali accumulator, which drives a tiny electric
motor with blades. This accumulator, which has the size of a 20
kopeck piece, can be charged by connecting it to a wall plug in
the evening, so that the razor can be used at any desired place
on the following day. Also cordless flat irons are produced,
which makes work much easier. 4.) The vacuum cleaner "Malyutka"
is a new kind of brush, which is very economic and is used for
dusting suits, carpets, books, and wireless sets. 5.) Automatic
switches. Architects ought to see that the staircases of all
houses are fitted out with automatic switches. This would mean
a considerable saving of current. 6.) Electric watchers. These
are the thermostats with which various electric devices are pro-
vided and are very useful in households. 7.) The hygienic
refuse remover. This is a special device by means of which
refuse is crushed while passing through the drain pipe after
which it is washed away by water. 8.) Glass radiates heat. Glass
is covered with a thin layer of a conductive metallic substance
through which the current passes. Bathroom mirrors heated in this
Card 2/3   manner do not get dim or clouded. 9.) Hot water from the main.

Electric Helpers at Home

SOV/29-58-8-14/23

A flow-type electric heater is fastened to the water tap and plugged into the wall. As soon as the tap is turned on warm or hot water flows out. Several of these household articles are illustrated on the fourth page. There are 5 figures.

1. Electrical equipment--Performance   2. Human engineering

Card 3/3

AUTHOR: Ivanov, G. K., Engineer   SOV/110-59-3-24/25

TITLE: A Scientific-Technical Conference on Domestic Washing
          Machines (Nauchno-tekhnicheskaya konferentsiya po
          bytovym stiral'nym mashinam)

PERIODICAL:Vestnik Elektropromyshlennosti, 1959, Nr 3, pp 75-77 (USSR)

ABSTRACT: A scientific technical conference on the design and
          production of domestic electric washing machines was held
          in Riga. It was called by the Electrical and Instrument
          Industry Department of State Plan USSR, the State
          Scientific-Technical Committee of the Council of Ministers
          of the Latvian SSR, the Electrical Engineering and
          Apparatus Construction Section of the Technical-Economic
          Council of the Council of National Economy of the
          Latvian SSR and the Riga Branch of the All-Union Chamber
          of Commerce. It was the first conference on this question.
          It was attended by more than 130 representatives of various
          organisations from Moscow, Riga, Leningrad, Ulan-Ude,
          Gor'kiy, Sverdlovsk, Chelyabinsk and other towns.
          Reports were read on the prospective development of the

Card 1/2   production of washing machines and the main lines of

SOV/110-59-3-24/25

A Scientific-Technical Conference on Domestic Washing Machines

development in design and manufacture. The reports mentioned the rapid growth of the production of these products. The chief designer of the REZ works, A.I.Krichko, gave a report on the theory of machine laundering which analysed the construction of various Soviet and foreign washing machines. The chief specialist of the State Scientific-Technical Committee of the Council of Ministers of the Latvian SSR, A.Ya.Fish made a comparative analysis of the cost of washing machines made at a number of works and considered standards of material consumption. Engineer N.A.Mushketov and Engineer V.T.Grebenichenko discussed various methods of driving washing machines, constructions of motors and so on. About 30 persons participated in the discussion and the contributions are very briefly reviewed.

Card 2/2

24.2300

25012
S/142/60/003/006/002/016
E033/E135

AUTHORS: Bonch-Osmolovskiy, A.G., and Ivanov, G.K.

TITLE: Circuits for obtaining high-intensity, approximately
              rectangular, pulsed magnetic fields

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
              Radiotekhnika. 1960, Vol.3, No.6, pp. 558-562

TEXT: This article describes a method and the apparatus for
producing pulsed magnetic fields having intensities up to 10^5 oe
and durations up to 200 microseconds. The pulse shape is
approximately rectangular with the first portion (H constant to an
accuracy of ± 1.5%) for 35% of the total time of the pulse.
A pulsed magnetic field may be produced by connecting the field-
producing coil L_c in the last section of an artificial line
(immediately before the matching load resistance) and discharging
the line. For coil currents of the order of 10^4 amps, the values
of the wave impedance of the line ζ and of the initial voltage to
which the line is charged are of the order of 0.2 Ohms and 2000 V
respectively. For this method, the minimum number of line sections
n is 8 - 10. A simpler and more efficient equivalent circuit is
Card 1/3

25812

Circuits for obtaining high-intensity   S/142/60/003/006/002/016
                                          E033/E135

shown in Fig.2. The complete circuit of the equipment, including
the charging and switching circuit, which uses a single mercury
excitron, is described. The experimental results are given. With
a pulse repetition frequency of 12.5 - 50 c/s magnetic fields up to
20 000 ce were obtained.

Acknowledgments are expressed to Professor K.I. Krylov who advised
in this work and to V.A. Skorobogatov who assisted with the
experiments.

There are 4 figures and 6 references: 3 Soviet and 3 non-Soviet.
The two English language references read as follows:

Ref.3: H. Furth, M. Levine, R. Waniek. Production and use of high
       transient magnetic fields. II, Rev. Sci. Instr., 1957, 28,
       949.

Ref.4: S. Foner and H. Kolm. Coil for pulsed megagauss fields.
       Rev. Sci. Instr., 1956, V.27, No.5, 517.

ASSOCIATION: Kafedra spetsfiziki Leningradskogo elektrotekhniches-
             kogo instituta im. V.I. Ul'yanova (Lenina)
             (Department of Special Physics, Leningrad Institute
             of Electrical Engineering imeni V.I. Ul'yanov (Lenin))

Card 2/3

IVANOV, G.K., inzh.

Some problems of the electrical industry pertaining to the
electrification of homes. Vest.elektroprom. 31 no.1:1-4 Ja
'60.
                                                    (MIRA 13:5)
            (Electrification)

IVANOV, G.K.

Neutron scattering by molecules with large energy transfer.
Zhur. eksp. i teor. fiz. 44 no.2:573-586 F '63.

(MIRA 16:7)

IVANOV, G.K.; SAYASOV, Yu.S.

Resonance interaction between neutrons and molecules. Atom.
energ. 19 no.2:183-184 Ag '65.   (MIRA 18:9)

20459

26. 2241

21. 6000 (1043, 1565)

S/056/61/040/002/022/047
B102/B201

AUTHORS: Sayasov, Yu. S., Ivanov, G. K.

TITLE: Theory of the dissociation of molecules by neutrons.
             I. Diatomic molecules

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki,
             v. 40, nc. 2, 1961, 513-523

TEXT: In a collision between neutron and bound molecule, sufficient
energy can be transferred to break the bond, i.e., to lead to a dis-
sociation. This process, which has not been studied so far, is of
great interest from the viewpoint of radiation chemistry, biology, and
the slowing down of neutrons. A knowledge of the dissociation
probability of molecules by neutrons is also important for the method
of molecular neutronoscopy proposed by V. I. Gol'danskiy (Ref. 1: ZhETF,
31, 717, 1956). The authors developed a theory of the dissociation of
diatomic molecules by neutrons based on the method of the Fermi
pseudopotential. The neutron is presupposed to have an energy E of the

Card 1/11

Theory of the dissociation of ...

order of the dissociation energy of the molecule (viz., $E \sim 10$ ev); a wavelength of $\lambda_n \sim 10^{-9}$ cm corresponds to these energies; inequalities $\lambda_n \gg A$ and $a \gg A$ must hold between λ_n, the radius of nuclear forces $A \sim 10^{-13}$ cm and the vibration amplitude of the nuclei in the molecule $a \sim 10^{-9}$ cm, for the method of the Fermi pseudopotential to be applicable. The molecule is further assumed to remain in the

ground state during decomposition. $V = 2\pi \ell^2 \sum_i \frac{1}{\mu_i} A_i \vec{\delta}(\vec{r}_n - \vec{r}_i)$ is

applied as interaction ansatz, where $\mu_i = m_i m/(m_i + m)$; here m denotes the neutron mass and m_i that of the i-th nucleus in the molecule, $A_i = a_i + b_i(\vec{i}\vec{s})$, the scattering amplitude of the neutron (spin $\vec{s}$) at the free nucleus (spin $\vec{i}$), $\vec{i}\vec{s}$ the eigenvalue of the operator $\vec{i}\,\vec{s}$;

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Theory of the dissociation of ...

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B102/B201

the relation $d\sigma = \frac{k'}{k}|W|^2 d\vec{x}_1 \dots d\vec{x}_n do$ is set for the dissociation cross section in first Born's approximation with respect to V- according to general perturbation-theoretical formulas for the transition probability from one state of the discrete spectrum to the continuous one. In this relation, do denotes an element of the solid angle, into which the neutron is scattered, k' and k are the wave numbers of the neutron prior to and after collision, $\vec{x}_1 \dots \vec{x}_n$ are the wave vectors of

the dissociation products. $W = \frac{\mu}{2\pi^2} \int e^{i(\vec{k}-\vec{k}')\vec{r}_n} \psi_0 V\psi_x d\vec{r}_n d\vec{r}$, where ψ_0 denotes the wave function of the initial state of the molecule, ψ_x is the wave function of the end state of the molecule; $d\vec{r}$ denotes integration over all molecular coordinates. Since it is assumed (in adiabatic approximation) for the electron state of the molecule to remain unchanged, the electron wave functions are excluded, and ψ_0 and ψ_x are regarded as wave functions of the relative motion of the nuclei. If

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Theory of the dissociation of ...

the electron state in the molecule is equal to Σ , the wave function
of the relative motion of the nuclei will coincide in adiabatic
approximation with that of the relative motion of two particles inter-
acting in a central-symmetrical manner. Formula

$$\overline{\psi_\varkappa} = \frac{1}{4\pi\varkappa r} \sum_{l=0}^{\infty} i^l (2l+1) e^{-i\delta_l} \chi_{\varkappa l}(r) P_l \left(\frac{\varkappa r}{\varkappa r}\right),\qquad (3)$$

holds, where $\chi_{\varkappa l}$ denotes the wave function of equation

$$\frac{d^2\chi_{\varkappa l}}{dr^2} + \left(\varkappa^2 - \frac{2\mu_m U}{\hbar^2} - \frac{l(l+1)}{r^2}\right)\chi_{\varkappa l} = 0,\qquad (4),$$

U is the molecule potential, μ_m is the reduced mass of the molecule.

The initial state of the molecule (vibration number n, rotation number K)

is given by $\psi_0 = \frac{1}{r}\left(\frac{2}{\pi}\right)^{1/4} a^{-1/2} e^{-\xi^2} H_n(\xi) Y_{KM_K}(\vartheta, \varphi)$, where

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Theory of the dissociation of ...

S/056/61/040/002/022/047
B102/B201

$\xi = (r-r_o)/a$, r_o is the minimum point of U, $a = \sqrt{2\hbar/\mu_m\omega}$ the vibration amplitude of the nuclei in the molecule, $H_n(\xi)$ the Hermitian function, M_K the projection of the torque of the molecule onto the molecule axis, θ, φ denote the orientation of the molecule in the c.m.s. of neutron and molecule. Thus, from

$$d\sigma = \frac{k'}{k}\frac{1}{2K+1}\sum_{M_K=-K}^{K}|W_{M_K}|^2 d\varkappa\, do,$$

(6)

$$W_{M_K} = \frac{\mu}{2\pi\hbar^2}\int e^{i(k-k')r_n}\psi_0 V \psi_\varkappa^{-*}dr_n\, dr,$$

$$V = 2\pi\hbar^2\left(\frac{A_1}{\mu_1}\delta(r_n - r_1) + \frac{A_2}{\mu_2}\delta(r_n - r_2)\right).$$

(7)

one obtains for the dissociation cross section

Card 5/11

Theory of the dissociation of ...

$$do_{nK} = \sqrt{\frac{\pi}{2}} \frac{k'}{k} \frac{1}{a} \left[\sum_{l=0}^{\infty} (2l+1) \sum_{L=|l-K|}^{l+K} (C_{loKo}^{Lo})^2 F_{lL} \right] dx \, do, \quad (9)$$

$$F_{lL} = \overline{A_1^2} \frac{1}{g_1^2} \left(\frac{\mu}{\mu_1}\right)^2 J_{g_1}^2 + \overline{A_2^2} \frac{1}{g_2^2} \left(\frac{\mu}{\mu_2}\right)^2 J_{g_2}^2 + (-1)^L 2 \overline{A_1 A_2} \frac{\mu^2}{\mu_1 \mu_2} J_{g_1} J_{g_2} \frac{1}{g_1 g_2},$$

$$J_g = \int_0^{\infty} \frac{1}{r} e^{-\zeta^2 r^2} H_n(\xi) \chi_{xl}(r) \psi_{L+\frac{1}{2}}(gr) \, dr,$$

$$\psi_{L+\frac{1}{2}}(x) = \sqrt{x} J_{L+\frac{1}{2}}(x), \quad g = g_{1,2} = \frac{m_{2,1}}{m_1 + m_2} |k - k'|, \quad (10),$$

where C_{loKo}^{Lo} denotes the Clebsch-Gordan coefficients. If the molecule

consists of different atoms, $\overline{A_{1,2}^2} = a_{1,2}^2 + \frac{1}{4} i_{1,2}(i_{1,2} + 1) b_{1,2}^2$;

$\overline{A_1 A_2} = a_1 a_2$, where $i_{1,2}$ denotes the nuclear spins. If it consists of

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equal atoms, $\overline{A^2_{1,2}} = a^2 + \frac{1}{4} i(i + 1)b^2$, $\overline{A_1 A_2} = a^2 + \frac{3}{8} b^2 \left[2i(i + 1) - \right.$
$\left. - I(I + 1) \right]$, where I denotes the total spin of the system of the two
nuclei. In the case of quasiclassical conditions (the wavelengths
($\lambda_n \sim 10^{-9}$ cm) corresponding to the neutron energies are small compared
with molecular sizes) one obtains

$d\sigma = \frac{1}{2\sqrt{2\pi}} \cdot \frac{k'}{k} a \frac{1}{x'} \frac{\mu^2}{\mu_1^2} \text{Ei}(-\rho^2) \varkappa d\varkappa do$ (18), and therefrom, if $\rho^2 > 1$: (19),

and if $\rho^2 < 1$: (20),

$$d\sigma = \frac{1}{2\sqrt{2\pi}} \frac{k'}{k} a \left(\frac{\mu}{\mu_1}\right)^3 \overline{A_1^2} \frac{1}{x'} \frac{e^{-\rho^2}}{\rho^2} \varkappa d\varkappa do, \quad (19)$$

$$d\sigma = \frac{1}{2\sqrt{2\pi}} \frac{k'}{k} a \left(\frac{\mu}{\mu_1}\right)^3 \overline{A_1^2} \frac{1}{x'} \ln(\gamma/\rho^2) \varkappa d\varkappa do \quad (20)$$

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where γ denotes Euler's constant. By integrating (18) with respect to

θ and $\varkappa$, one obtains the total cross section $\sigma = \pi A_1^2 \frac{\mu \mu_m}{\mu_1^2} \frac{E-D}{E}$, and in .

case of an n-p collision in a heavy molecule ($\mu = \mu_m = m$, $\mu_1 = m/2$,

$\mu \mu_m / \mu_1^2 = 4$), $\sigma = \sigma_0 (E-D)/E$. If $ak' \gg 1$, θ can be determined from

$$\varkappa' \approx \sqrt{\frac{\mu_m}{\mu}(k^2 - k'^2)} = g_1 = \frac{m_2}{m_1 + m_2} \cdot \sqrt{k^2 + k'^2 - 2kk' \cos\theta},$$

$$\cos\theta_0 = [(\nu + 1) p'^2 - (\nu - 1) p^2]/2pp',$$

$$p = k\hbar, \quad p' = k'\hbar, \quad \nu = m_1 (m_1 + m_2 + m)/mm_2. \tag{24}$$

If θ is almost equal to θ_0 and $\vartheta_0 \ll 1$, $\vartheta \ll \theta_0$, one obtains from (18):

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$d\sigma = \dfrac{\sigma_0}{\sqrt{2\pi}}\left(\dfrac{p'}{p}\right)^2 Ei\left(\dfrac{-\vartheta^2}{\vartheta_0^{\,2}}\right)\dfrac{1}{p_0}\,dp'\,d\vartheta$. The threshold-near dissociation cross

section is calculated next. If the neutron energy is near the dissociation energy D, and the discrete level ε of the molecule is deep enough for $E - D \ll \varepsilon$, one obtains

$$d\sigma = \frac{1}{\sqrt{2\pi}}\,\sigma_0\,\frac{a}{r_0^3\alpha}\,\frac{\cos^2\tau}{\cos^2 q}\,\frac{k'x^3}{k^4}\,dx\,do,$$

$$\tau = \int_{r_1}^{r_0}\tilde{x}_0\,dr - gr_0.$$

(28)

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Thus, $\sigma = \frac{1}{2}\left(\frac{\pi}{2}\right)^{3/2}\sigma_0\frac{a}{\alpha r_0^2}\left(\frac{E-D}{D}\right)^2\frac{\cos^2\tau}{\cos^2 q}$, $q = \frac{1}{\hbar}\int_{r_1}^{\infty}\sqrt{-2\mu_m U}\,dr = \pi\left(n + \frac{1}{2}\right)$.

The total cross section may be also obtained from

$$d\sigma = \frac{1}{\sqrt{2\pi}}\sigma_0\frac{a}{r_0^2\alpha}\frac{\cos^2\tau}{\cos^2 q + \pi^2 x^2/\alpha^2}\frac{k'x^2}{k^4}d\varkappa do.$$

(32).

In this case, $\sigma = \frac{1}{\sqrt{2\pi}}\sigma_0\frac{a\alpha}{r_0^2 k_m^2}\frac{E-D}{D}\cos^2\tau$, $k_m^2 = \frac{2\mu_m D}{\hbar^2}$.

V. I. Gol'danskiy is thanked for having suggested the subject, A. I. Baz', A. S. Kompaneyets, and F. L. Shapiro for their discussions. Some mathematical problems are discussed in an appendix. There are 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

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Theory of the dissociation of ...

S/056/61/040/002/022/047
B102/B201

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute
               of Chemical Physics, Academy of Sciences, USSR)

SUBMITTED: June 26, 1960

Card 11/11

26. 2242

AUTHOR: Ivanov, G. K.

TITLE: Neutron scattering from molecules

PERIODICAL: Atomnaya energiya, v. 12, no. 1, 1962, 49 - 51

TEXT: When studying the problem of neutron thermalization the scattering function must be known as precisely as possible. The much-used "single-atom" approximation (e. g. Phys. Rev., 106, 290) is inexact, due in particular to incorrect averaging of the scattering effect over molecular orientations. Correct averaging over the rotational orientations was carried out. within the framework of classical mechanics. The differential cross section and its moments were obtained as computable integrals:

$$\frac{d^2\sigma}{d\varepsilon\,d\Omega} = \frac{\sigma_\infty}{4\pi}\,\frac{k}{k_0}\,\frac{M}{\sqrt{2\pi k_B T}} \int_0^x \exp\left\{-\frac{M}{2k_B T x^2}\left[\varepsilon - \frac{x^2}{2M}\right]^2\right\}\frac{dx}{x\sqrt{x^2 - x^2}}. \qquad (3)$$

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$$\frac{d\sigma(p_0 \to p)}{dp} = \frac{\sigma_\infty}{\sqrt{4\pi}} \frac{p}{p_0^3} \left(\frac{M}{m}\right)^{1/2} \int_0^{p_0+p} \exp\left\{-\frac{1}{4}\frac{m}{M}\frac{1}{x^2}\left[\frac{M}{m}(p_0^2-p^2)-x^2\right]^2\right\},\tag{4}$$

$$dx\begin{cases} \ln\dfrac{p_0+p+\sqrt{(p_0+p)^2-x^2}}{|p_0-p|+\sqrt{(p_0-p)^2-x^2}} & x<|p_0-p| \\[2mm] \ln\dfrac{p_0+p+\sqrt{(p_0+p)^2-x^2}}{x} & x>|p_0-p|. \end{cases}$$

$\vec{k}_0$, $\vec{k} = \vec{k}_0 - \vec{\varkappa}$, neutron momentum before and after scattering;
$\varepsilon = k_0^2/2m - k^2/2m$; m - neutron mass; k_B - Boltzmann constant; $\sigma_\infty = 4\pi a^2$,
a - scattering length for a fixed nucleus, p_0 and p are the neutron
momenta in terms of $\sqrt{2mk_BT}$; $M = Ib^{-2}$, b - radius vector of the target
nucleus. Eq. (4) is compared with Cohen's formula (First Geneva Conference
on Peaceful Uses of Atomic Energy, 1955) for neutron scattering from the
proton of the HCl molecule (M ⚹ m). The results diverge, especially in
the elastic part. Divergence increases when higher neutron energies are
considered. The classical model of the rigid rotator seems to be

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S/056/63/044/002/029/065
B102/B186

AUTHOR: Ivanov, G. K.

TITLE: Neutron scattering from molecules with large energy transfer

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,
               no. 2, 1963, 573-586

TEXT: Neutron scattering from molecules is investigated under the assump-
tion that the energy transferred per collision is much greater than the
mean difference between the vibrational energy levels of the molecules.
The author uses the formalism developed by G. Placzek (Phys. Rev. 86, 377,
1952), C. C. Wick (Phys. Rev. 94, 1228, 1954), and Glauber and Zemach
(Phys. Rev. 101, 118, 129, 1956). Since the Placzek-Wick method is
suitable only for obtaining the fundamental features of the collision, it
is generalized to yield additional characteristics, e.g. the cross-section
derivatives $d^2\sigma_v/d\varepsilon do = \sigma_v(\vec{n}, \varepsilon)$; ε is the energy transferred, and o the
solid angle. This differential cross-section is obtained as a series
expansion whose terms are averaged over the angular orientations of the

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molecule:

$$\sigma_v(\varkappa, \varepsilon) = a_v^2 \frac{k}{k_0} \left\langle \delta\left(\frac{\varkappa^2}{2M_v} - \varepsilon + L_v\right) + \frac{1}{2}\delta^{(2)}\left(\frac{\varkappa^2}{2M_v} - \varepsilon + L_v\right)[H, L_v] + \right.$$

$$+ \frac{1}{6}\delta^{(3)}\left(\frac{\varkappa^2}{2M_v} - \varepsilon + L_v\right)\{[[H, L_v], L_v] + [H, [H, L_v]]\} +$$

$$\left. + \frac{1}{8}\delta^{(4)}\left(\frac{\varkappa^2}{2M_v} - \varepsilon + L_v\right)[H, L_v][H, L_v] + \ldots +\right\rangle. \qquad (9)$$

$$H = \sum_\mu p_\mu^2/2M_\mu + V; \qquad L_v = \varkappa p_v/M_v. \qquad (3), (4);$$

$\vec{k}_0$ and $\vec{k}_0 - \vec{\varkappa}$ are the neutron momenta before and after scattering, a_v the scattering length, $\varepsilon = k_0^2/2m - k^2/2m$, m the neutron mass, H the Hamiltonian of the scattering system. The first term of (9) corresponds to the momentum approximation (cf. ZhETF, 31, 717, 1956); the further terms are corrections to it. The combination of rotational and vibrational effects arising in scattering from arbitrary molecules can also be treated by this method. The results

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$$\sigma_v(\varkappa, e) = a_v^2 \frac{k}{k_0} \left\langle \frac{1}{\sqrt{\pi a}} \left\{ 1 + \frac{1}{3c^2} \sum (\varkappa c_v')^2 \omega_l^2 \frac{E}{a} \left[2 \frac{E^2}{a^2} - 3 \right] \right\} e^{-E^2/a^2} \right\rangle_{\Omega_{MO,i}}, \tag{27}$$

$$a^2 = \Sigma(\varkappa c_v')^2 \omega_l \operatorname{cth} \frac{\omega_l}{2T} + 2T(\varkappa R_v \varkappa + \varkappa^2/M); \qquad E = e - \varkappa^2/2M_v. \tag{28}$$

$$\frac{d\sigma}{dk} = \sigma_v \frac{(M_v + m)^2}{4M_v m} \frac{k}{k_0^3} \left\langle \exp\left(\frac{k_0^2}{a_0^2} - \frac{k^2}{a_0^2} \right) \operatorname{erf}\left(\gamma \frac{k_0}{a_0} - \eta \frac{k}{a_0} \right) + \operatorname{erf}\left(\gamma \frac{k}{a_0} - \eta \frac{k_0}{a_0} \right) - \right.$$
$$\left. - \left[\exp\left(\frac{k_0^2}{a_0^2} - \frac{k^2}{a_0^2} \right) \operatorname{erf}\left(\gamma \frac{k_0}{a_0} + \eta \frac{k}{a_0} \right) - \operatorname{erf}\left(\gamma \frac{k}{a_0} + \eta \frac{k_0}{a_0} \right) \right] \right\rangle_{\Omega_{MO,i}}, \tag{29}$$

$$\sigma_v = 4\pi a_v^2 M_v^2 (m + M_v)^2 \qquad a_0^2 = M_v^2 a^2/\varkappa^2,$$

$$\eta = \frac{1}{2}\left(\sqrt{\frac{M_v}{m}} - \sqrt{\frac{m}{M_v}} \right), \quad \gamma = \frac{1}{2}\left(\sqrt{\frac{M_v}{m}} + \sqrt{\frac{m}{M_v}} \right), \quad \operatorname{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} dt.$$

and for the total cross-section

$$\frac{d\sigma}{dk} = \sigma_{11} \frac{2k}{k_0^2} J(k), \qquad J(k) = \left\langle \operatorname{erf} \frac{k}{a_0} \right\rangle_{\Omega_{MOA}}, \tag{30}$$

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are obtained in momentum approximation. In these formulas one has to average the molecular orientations; when this averaging can be made exactly (which is possible for a certain class of molecules), the results can be considered exact. The calculations are carried out for biatomic and complex molecules and, numerically, for H_2O. There are 2 tables.

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ABSTRACT: A general method is developed for investigating the proba-